Ministry of Forests

FIA SPACING STANDARDS

Effective April 1, 2005

These standards apply, in addition to the General FIA Standards (FS 1001), to all juvenile spacing activities funded under the Forest Investment Account (FIA).

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ARTICLE 1: DEFINITIONS

1.1 In this document, the following words shall have the following meanings.

"Approved Spacing Quality Inspection System" means the Ministry of Forests' current Juvenile Spacing Quality Inspection system in effect immediately prior to the commencement of Work **or** another similar system approved in writing by the District Manager prior to the commencement of Work.

"Crop Tree" means a tree that is:

(a) of a Specified species;

(b) equal to or greater than a Specified minimum Inter-tree Distance from any other Crop Tree;

(c) equal to or greater than a Specified minimum cutting height;

(d) selected from among adjacent trees in accordance with the specifications of this document; and

(e) is not a Leave Tree.

"Inter-tree Distance" means the horizontal distance between two trees on a centre to centre basis, calculated or measured to the nearest $1/10^{th}$ of a metre.

"Leave Tree" means a tree other than a Crop Tree that is Specified not to be cut.

"**No-treatment Zone"** means an area within which no Spacing takes place.

"Natural Opening" means an area in the original stand that has no trees above the Specified minimum cutting height, and has an average diameter greater than twice the Target Inter-tree Distance.

"Slash Removal Zone" means an area within which all slash created as a result of the Work is removed.

"Spacing" means the reduction of the number of stems per hectare of the original stand within the Work Area to within a Specified range of post-spacing densities.

"Spaced Stand" means the portion of the Work Area on which Spacing took place.

"Target Inter-tree Distance" means, unless otherwise Specified, the distance determined by the formula:

$$\sqrt{\frac{11{,}547}{\text{Target Stems Per Hectare}}}$$

"Target Stems Per Hectare" means a Specified target number of Crop Trees per hectare to be retained.

"Void" means an area within a Spaced Stand that, as a result of over-cutting, has no Crop Trees within the Target Inter-tree Distance of its centre. For the purpose of this definition, any tree which has been damaged during Spacing and which is unlikely to survive as a result of the damage is not a Crop Tree.

"Wildlife Tree" means a tree that a Treatment Plan, Work Plan, or a certified wildlife tree assessor specifies as a wildlife tree.

ARTICLE 2: SPACING STANDARDS

General Requirements

2.1 Despite any requirement that is Specified on a per hectare basis, all spacing and density requirements must be met throughout the entire Work Area, so that Crop Trees are as well distributed as possible.

2.2 Motorized tracked or wheeled thinning machinery must not be used without the prior written approval of the District Manager.

Work Plans

2.3 Where any of the following is not specified in a Treatment Plan for Spacing it must be specified by Treatment Unit in a Work Plan:

(a) the Crop Tree species, in the order of preference;

(b) the Target Stems per Hectare to be retained;

(c) the minimum and maximum number of Crop Trees per hectare to be retained;

(d) a minimum cutting height below which trees are not required to be cut;

(e) the minimum Inter-tree Distance between Crop Trees; and

(f) the locations, if any, and widths of Slash Removal and No-treatment Zones.

Selection of Crop Trees

2.4 A total number of Crop Trees per hectare must be selected that is:

(a) as near as is possible to the Target Stems per Hectare to be retained;

(b) not less than the Specified minimum number of Crop Trees per hectare to be retained; and

(c) not more than the Specified maximum number of Crop Trees per hectare to be retained.

2.5 The Spaced Stand must not have a Crop Tree that is closer than the minimum Inter-tree Distance to another Crop Tree or to a tree above a Specified minimum cutting height that is within a No-treatment Zone or along the outside border of a Work Area.

2.6 Crop Trees must be selected that are as close as possible to the Target Inter-tree Distance from each other, but the distance between Crop Trees must be varied within allowable spacing criteria so as to select those trees having the best overall possible combination of:

(a) Crop Tree species in the Specified order of preference; and

(b) the tallest trees having good form and vigour and which can be expected to continue exhibiting superior growth in comparison to adjacent trees.

[Note: Consistently selecting Crop Trees that are close to the minimum Inter-tree Distance will likely result in exceeding a Specified maximum number of trees per hectare to be retained, whereas consistently selecting trees that are further apart than the Target Inter-tree Distance risks not achieving a Specified minimum tree retention requirement.]

2.7 When evaluating Crop Trees for good form and vigour the selected trees must optimize as many of the following characteristics as possible:

(a) free of injury and disease;

(b) healthy live crown of good colour;

(c) straight stem with no forks or multiple tops;

(d) a sturdy stem in relation to height, suited to resisting potential wind and snow damage after spacing;

(e) small branch diameters; and

(f) good terminal leader growth.

Additional Crop Trees Around Natural Openings

2.8 Additional Crop Trees must be left uncut around the edge of a Natural Opening equivalent to the number of trees that the opening could accommodate at the Target Inter-tree Distance. The distance between such Crop Trees must not be less than the minimum Inter-tree Distance.

Trees Not to be Cut (Leave Trees)

2.9 The following trees must not be cut or damaged:

(a) a tree that does not meet the requirements of a Crop Tree if

i) cutting the tree will create a Void, and

ii) the tree is equal to or greater than the Target Inter-tree Distance to a Crop Tree;

(b) a tree within a Natural Opening;

(c) a Wildlife Tree;

(d) a tree larger than a Specified maximum cutting diameter; or

(e) a pacific yew tree.

2.10 Except for clause (a), a tree that is Specified as not to be cut in the preceding section may be less than the minimum Inter-tree Distance to a Crop Tree.

Trees Not Required to be Cut

2.11 The following trees are not required to be cut:

(a) a tree less than a Specified minimum cutting height; or

(b) a tree that is not a Crop Tree that is more than the Target Inter-tree Distance from a Crop Tree.

2.12 If a tree that is not required to be cut is cut, it must be cut to the specifications contained herein.

Trees to be Cut or Girdled

2.13 All trees in a Work Area that are not Crop Trees, Leave Trees, or trees Specified as not required to be cut, must be cut.

2.14 A tree that is required to be cut must be girdled if it cannot be cut without damaging a Crop Tree or a Leave Tree.

Mistletoe Eradication

2.15 Where an objective of Spacing is mistletoe eradication, all infected trees that are designated for cutting must be completely cut or girdled at a point below the lowest live limb or below a Specified maximum treatment height, whichever is lower.

2.16 If a maximum treatment height for mistletoe eradication is not Specified, it shall be 30 centimetres above the point of germination.

Cutting Specifications

2.17 A tree that is cut must be cut so that:

(a) it is cut completely through (i.e., must not be hinged);

(b) the stump is not higher than 30 cm from the point of germination;

(c) no live limbs remain on the stump;

(d) the stump cut angle is not greater than 30^{o} (thirty degrees) from the horizontal;

(e) it does not lean against a standing tree; and

(f) it does not fall onto a fence or into a stream.

2.18 A forked or multiple-topped tree selected as a Crop Tree must not have any part of it cut.

Girdling Specifications

2.19 Unless otherwise Specified, a girdle must consist of a single, continuous girdle band around the entire tree that is a minimum of 1.5 cm in vertical width and that completely severs the bark and cambium over its entire width.

2.20 Despite any other requirement herein, a tree must not be girdled if it is within one tree length of a trail or road.

Treatment of Slash

2.21 Slash or debris must be removed and redistributed within the Spaced Stand if, as a result of the Work, it occupies:

(a) a Slash Removal Zone;

(b) a road, road-bank, stream, ditch, or fireguard;

(c) a cattle or game trail; or

(d) adjacent standing timber.

ARTICLE 3: INSPECTION & NOTIFICATION

Spacing Quality Inspection

3.1 All Work must be inspected by a person (the "Inspector") who is:

(a) the Registered Professional Forester (RPF), or operates under the direction of the RPF, who will sign and professionally seal reports for the Work;

(b) experienced and competent in conducting inspections of spacing operations;

(c) familiar with the Treatment Plans and Work Plans for the Work Areas; and

(d) not engaged in the direct conduct of the spacing operations.

3.2 An Inspector must inspect the Work in accordance with an Approved Spacing Quality Inspection System in a timely manner to ensure all Work is performed to the FIA Standards.

Determination of Satisfactory Treatment

3.3 An area may be declared satisfactorily treated when:

(a) the average performance quality of all plots is 85% or higher;

(b) the number of Crop Trees per hectare does not exceed the Specified maximum and is equal to or greater than the Specified minimum number of trees per hectare to be retained;

(c) unless otherwise Specified by the District Manager, there are no contiguous areas greater than one tenth (1/10) hectare that do not meet the performance quality and density requirements.

Requirement to Notify the District Manager

3.4 Further to the notification requirements contained in the General FIA Standards (FS 1001), a Recipient must immediately notify the District Manager whenever an inspection reveals on any contiguous area greater than one-tenth (1/10) hectare (or other minimum area that may be Specified by the District Manager):

(a) performance quality to be less than the minimum acceptable standard of eighty-five percent (85%), and the nature and extent of the errors are such that performance quality cannot be raised to at least 85%; or

(b) a Specified minimum number of Crop Trees per hectare to be retained has not been retained.